

Claims

1 1. A viral expression vector comprising a nucleic
2 acid which comprises (1) a transcriptional start site; (2) a
3 promoter operably linked to the transcriptional start site;
4 and (3) an enhancer operably linked to the promoter, the
5 enhancer comprising the DNA sequence of SEQ ID NO:1 or the
6 RNA equivalent thereof.

1 2. The viral expression vector of claim 1, wherein
2 the vector is a retrovirus.

1 3. The viral expression vector of claim 1, wherein
2 the promoter drives transcription of a mRNA encoding a
3 polypeptide, the transcription beginning from the
4 transcriptional start site.

1 4. The viral expression vector of claim 3, wherein
2 the polypeptide is a growth hormone.

1 5. The viral expression vector of claim 1, wherein
2 the promoter is a tissue-specific promoter.

1 6. The viral expression vector of claim 5, wherein
2 the promoter is a ζ -globin promoter.

1 7. The viral expression vector of claim 1, wherein
2 the enhancer comprises SEQ ID NO:2 or the RNA equivalent
3 thereof.

1 8. The viral expression vector of claim 7, wherein
2 the enhancer comprises SEQ ID NO:3 or the RNA equivalent
3 thereof.

1 9. The viral expression vector of claim 1, wherein
2 the nucleic acid further comprises a transcriptional
3 termination signal that terminates transcription from the
4 transcriptional start site.

1 10. The viral expression vector of claim 9, wherein
2 the vector is a retrovirus.

1 11. The viral expression vector of claim 9, wherein
2 the promoter drives transcription of a mRNA encoding a
3 polypeptide, the transcription beginning from the
4 transcriptional start site.

1 12. The viral expression vector of claim 9, wherein
2 the transcriptional termination signal is a polyadenylation
3 signal.

1 13. A transgenic animal whose somatic and germ line
2 cells contain at least one copy of a transgene comprising
3 (1) a transcriptional start site; (2) a promoter operably
4 linked to the transcriptional start site; and (3) an
5 enhancer operably linked to the promoter, the enhancer
6 comprising the nucleotide sequence of SEQ ID NO:1,
7 wherein the transgenic animal expresses a transcript
8 driven by the promoter, the level of expression in at least
9 one cell type of the animal being proportionally dependent
10 on the copy number of the transgene.

1 14. The transgenic animal of claim 13, wherein the
2 animal is a rodent.

1 15. The transgenic animal of claim 14, wherein the
2 animal is a mouse.

1 16. The transgenic animal of claim 15, wherein the
2 somatic and germ line cells contain more than 5 copies of
3 the transgene.

1 17. The transgenic animal of claim 16, wherein the
2 somatic and germ line cells contain more than 15 copies of
3 the transgene.

1 18. The transgenic animal of claim 17, wherein the
2 promoter drives transcription of a mRNA encoding a
3 polypeptide, the transcription beginning from the
4 transcriptional start site.

1 19. The transgenic animal of claim 18, wherein the
2 polypeptide is a growth hormone.

1 20. The transgenic animal of claim 19, wherein the
2 promoter is a β -globin promoter, and the at least one cell
3 type is a erythroblast.

1 21. The transgenic animal of claim 20, wherein the
2 enhancer comprises SEQ ID NO:2.

1 22. The transgenic animal of claim 21, wherein the
2 enhancer comprises SEQ ID NO:3.

1 23. A method of expressing a transcript in an
2 animal, the method comprising administering to the animal a
3 nucleic acid comprising (1) a transcriptional start site for
4 the transcript; (2) a promoter operably linked to the
5 transcriptional start site; and (3) an enhancer operably
6 linked to the promoter, the enhancer comprising the DNA
7 sequence of SEQ ID NO:1 or the RNA equivalent thereof.

1 24. The method of claim 23, wherein the nucleic
2 acid is administered by parenteral injection.

1 25. The method of claim 23, wherein the nucleic
2 acid is administered via a viral expression vector.

1 26. The method of claim 23, wherein the transcript
2 is a mRNA encoding a polypeptide.

1 27. The method of claim 26, wherein the polypeptide
2 is a growth hormone.

1 28. The method of claim 23, wherein the promoter is
2 a β -globin promoter.

1 29. The method of claim 23, wherein the enhancer
2 comprises SEQ ID NO:2 or the RNA equivalent thereof.

1 30. The method of claim 23, wherein the enhancer
2 comprises SEQ ID NO:3 or the RNA equivalent thereof.

1 31. The method of claim 23, wherein the nucleic
2 acid further comprises a transcriptional termination signal.

1 32. The method of claim 31, wherein the
2 transcriptional termination signal is a polyadenylation
3 signal.

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